

Figure 1 A

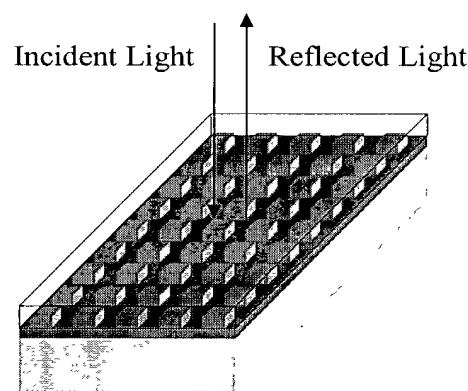


Figure 1 B

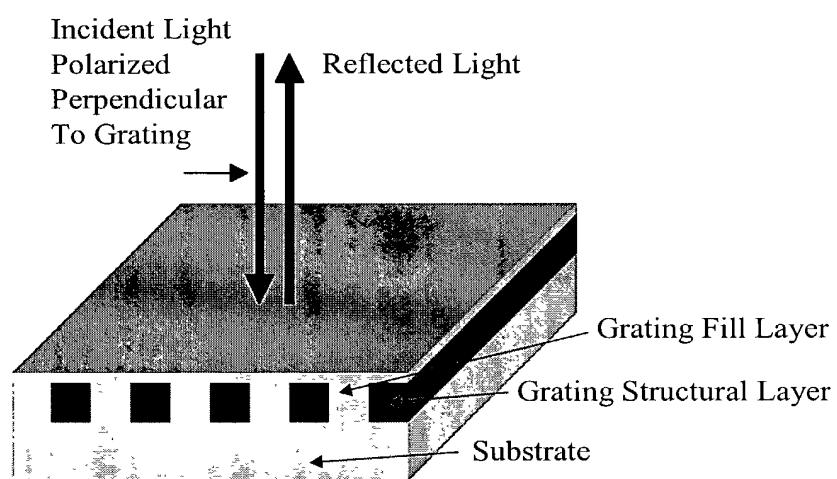


Figure 2

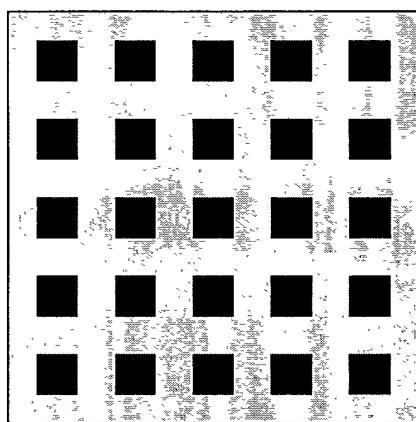


Figure 3A

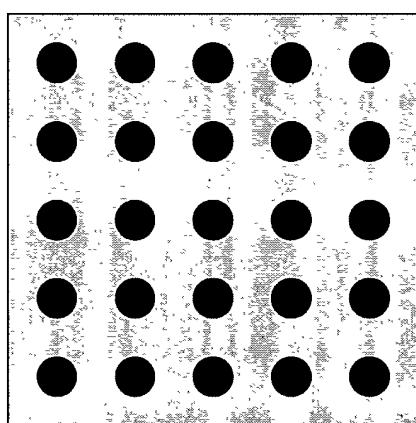


Figure 3B

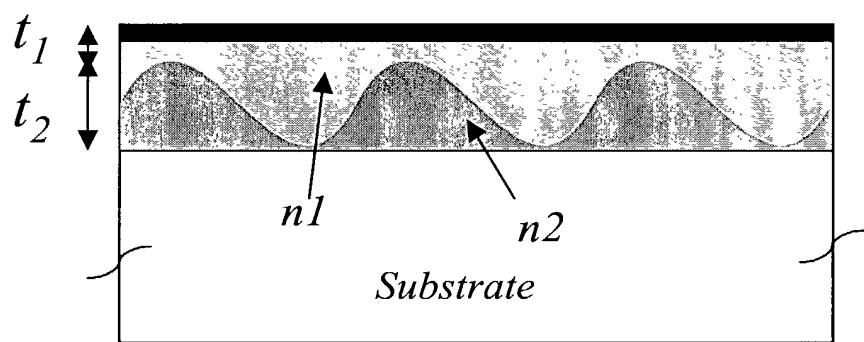


Figure 4

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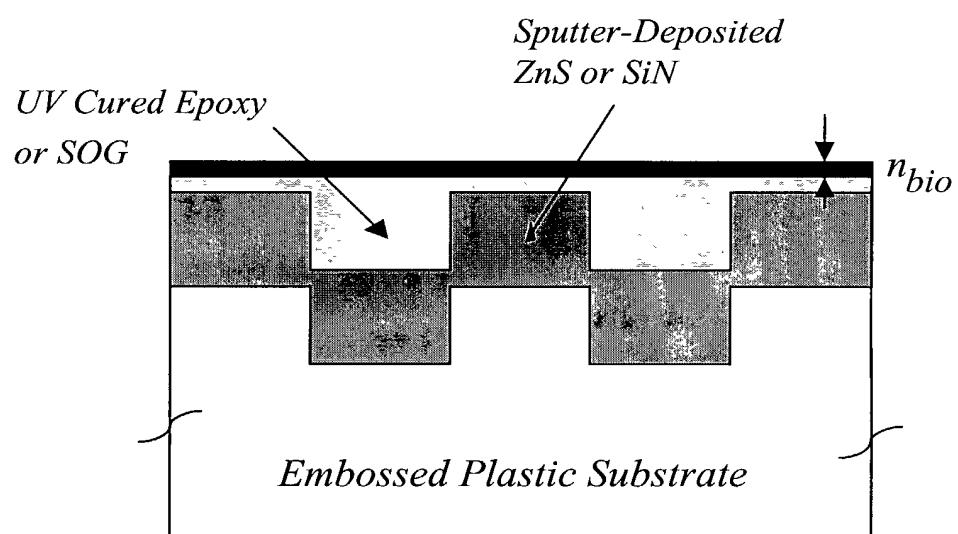


Figure 5

Amine	<ul style="list-style-type: none"> ➤ Sulfo-succinimidyl-6-(biotinamido)hexanoate (Sulfo-NHS-LC-Biotin) <ul style="list-style-type: none"> • Streptavidin / avidin then biotinylated molecule ➤ N,N'-disuccinimidyl carbonate (DSC); • -NH₂, non-cleavable ➤ Dimethyl pimelimidate (DMP); • -NH₂, non-cleavable ➤ Dimethyl 3,3'-dithiobispropionimidate (DTBP); • -NH₂, cleavable ➤ 1-Ethyl-3-(3-Dimethylaminopropyl)carbodiimide Hydrochloride (EDC) and N-Hydroxysulfosuccinimide (Sulfo-NHS); • -COOH ➤ Sulfo-succinimidyl 6-[a-methyl-a-(2-pyridyl-dithio)toluamido] hexanoate (Sulfo-LC-SMPT); • -SH, cleavable ➤ N-(B-Maleimidopropoxy)succinimide ester (BMPS) <ul style="list-style-type: none"> • -SH₂, non-cleavable ➤ Sulfo-succinimidyl 4-[N-maleimidomethyl)cyclohexane-1-carboxylate (Sulfo-SMCC); • -SH, non-cleavable
Aldehyde	<ul style="list-style-type: none"> ➤ Directly with aldehyde or first amino then aldehyde <ul style="list-style-type: none"> • -NH₂
Ni(II)	<ul style="list-style-type: none"> ➤ Using Nitrilotriacetic acid (NTA) group, which forms a chelate with Ni(II) <ul style="list-style-type: none"> • His-tagged molecules

Figure 6



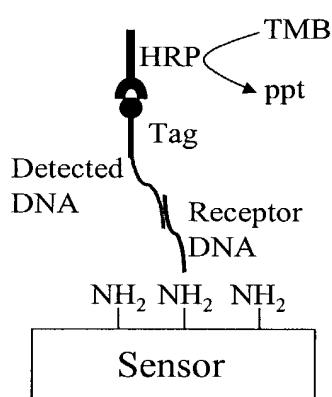


Figure 7A

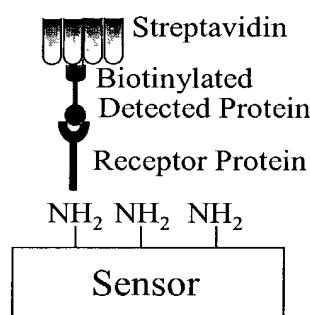


Figure 7B

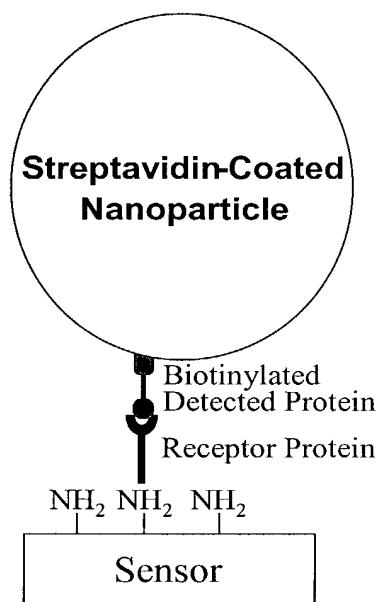
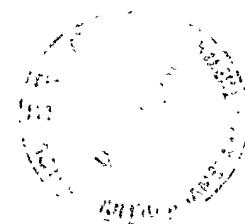


Figure 7C



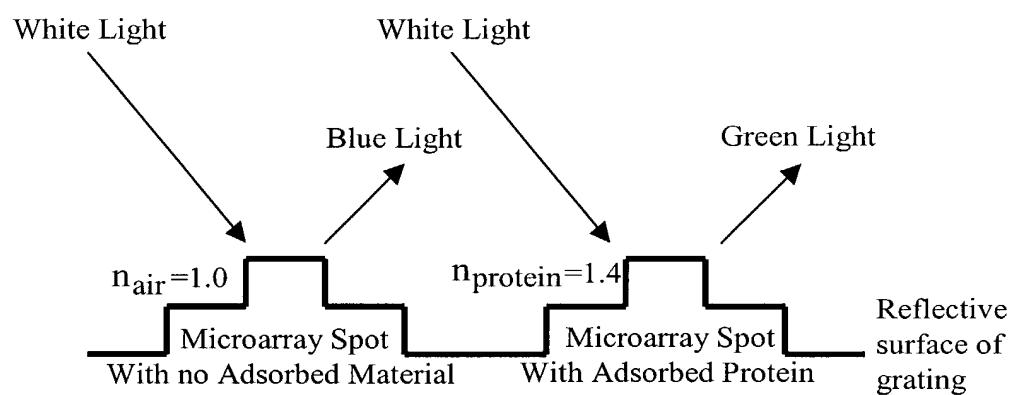


Figure 8

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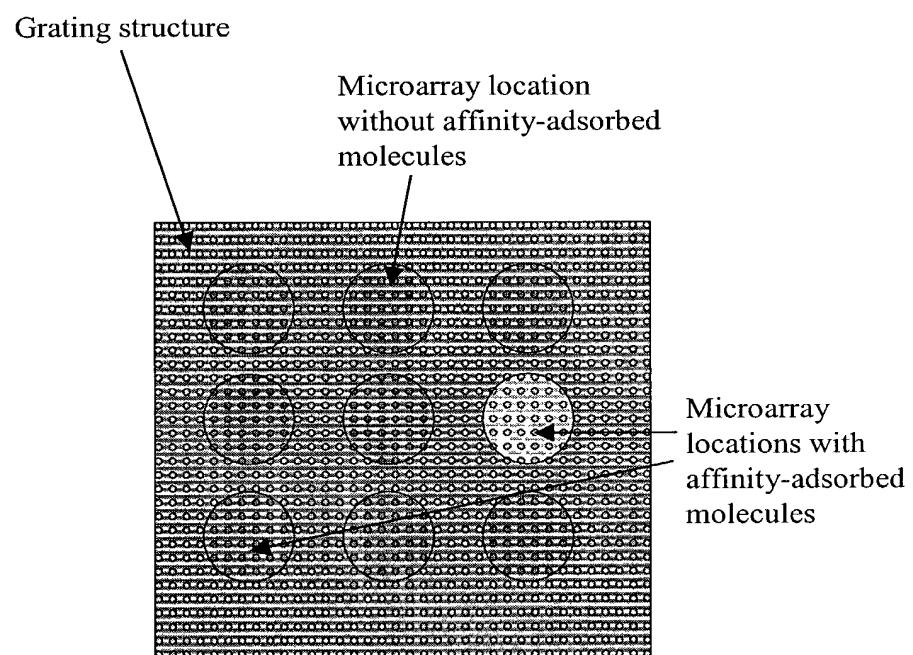


Figure 9

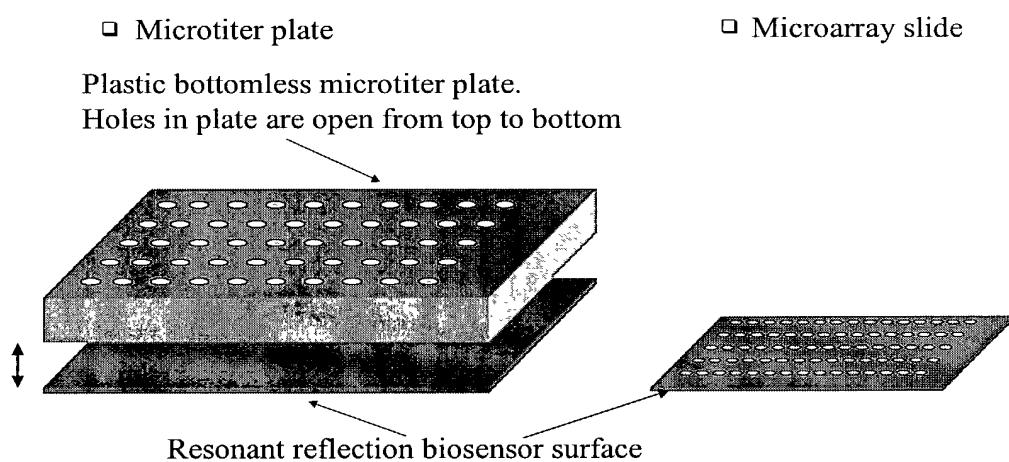
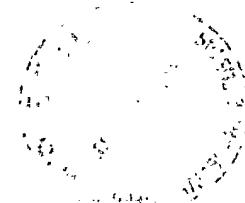


Figure 10A

Figure 10B



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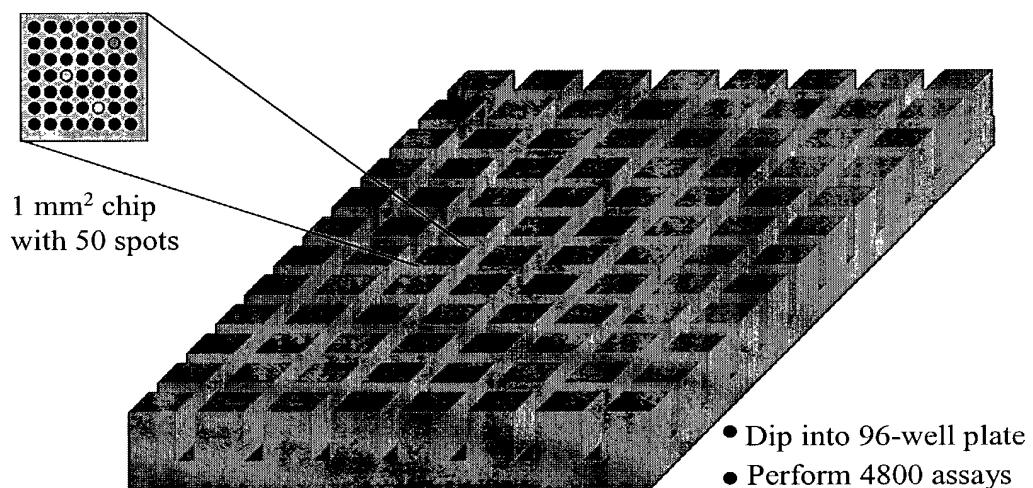


Figure 11



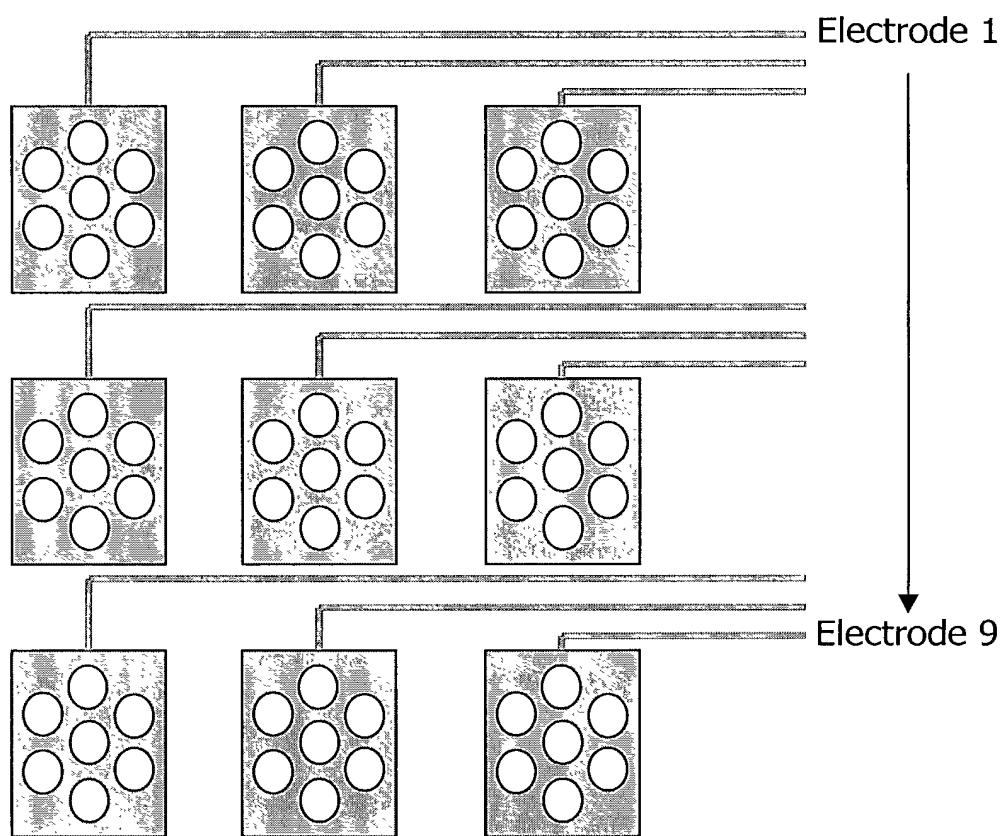
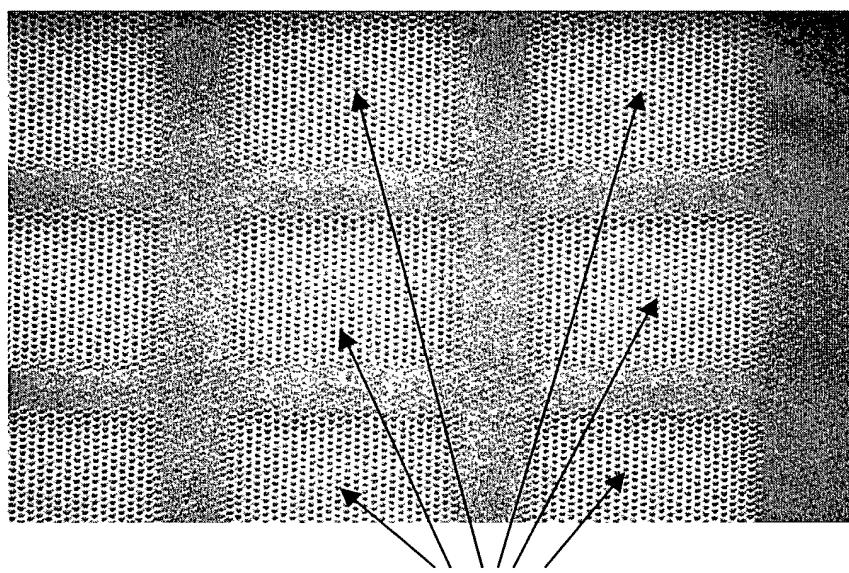


Figure 12

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Separate electrode grating regions

Figure 13



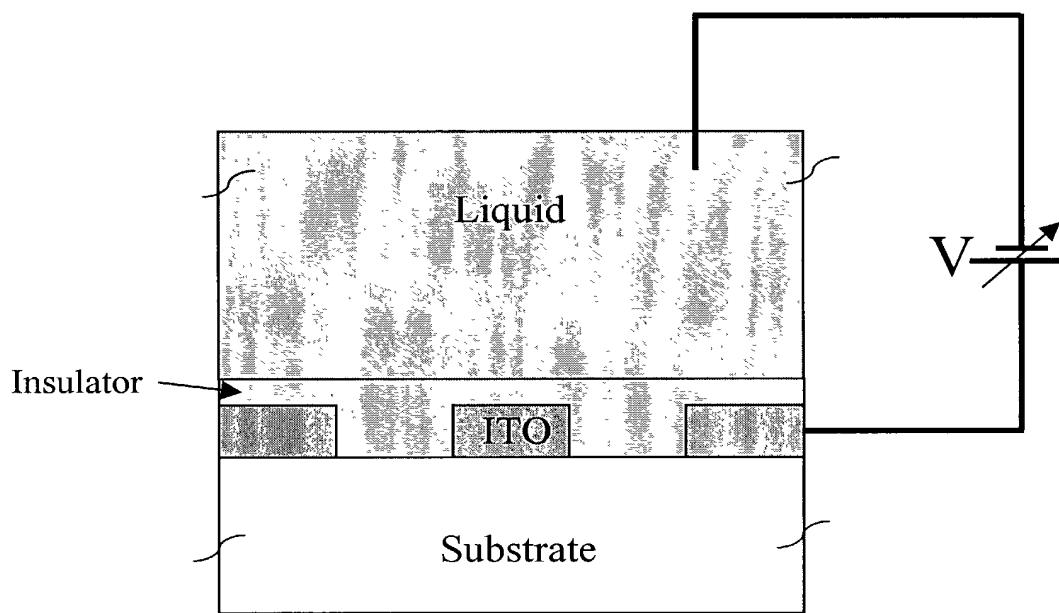


Figure 14

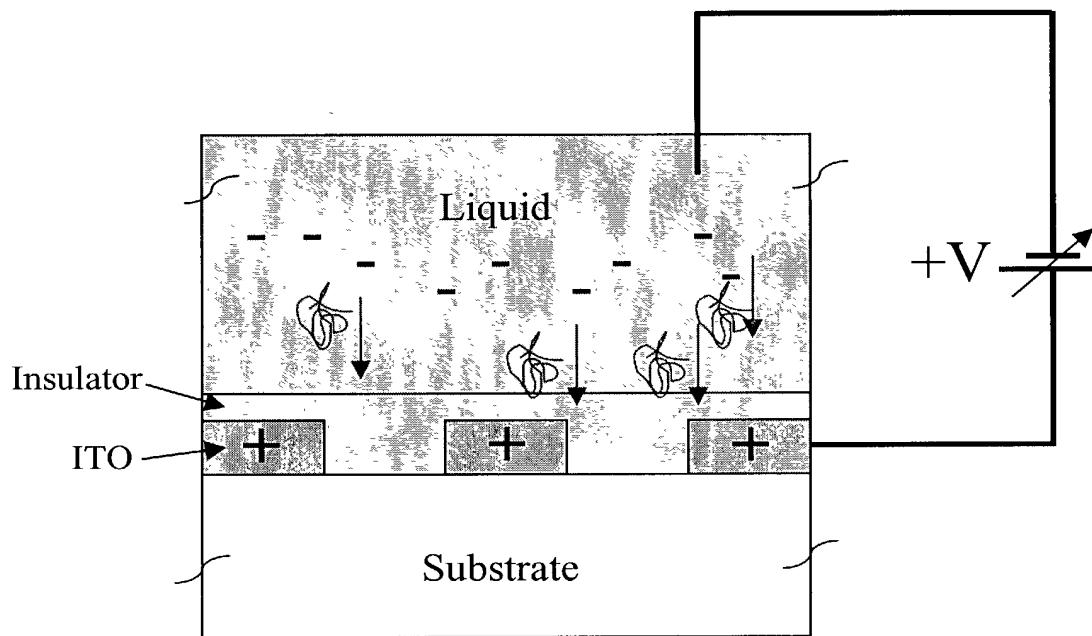


Figure 15

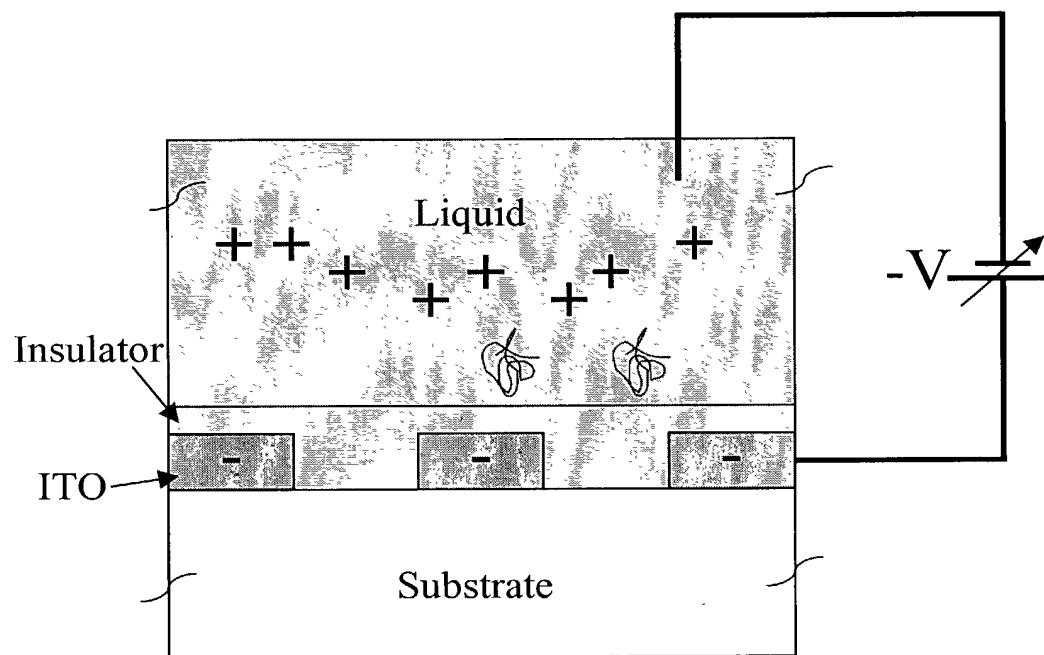


Figure 16

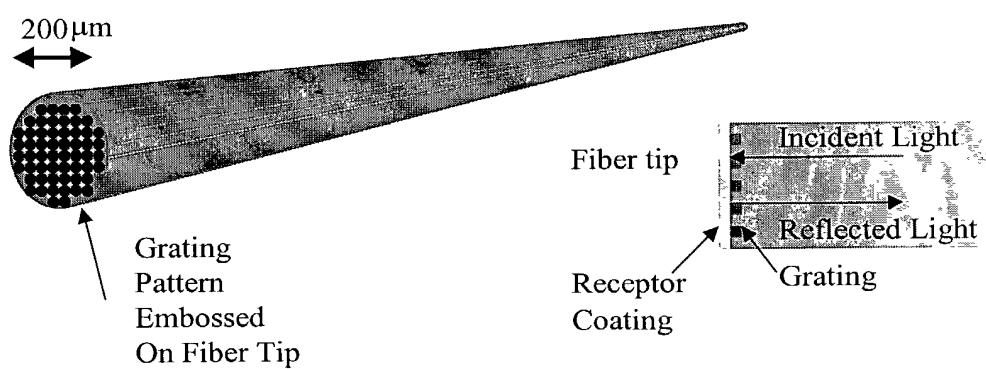


Figure 17

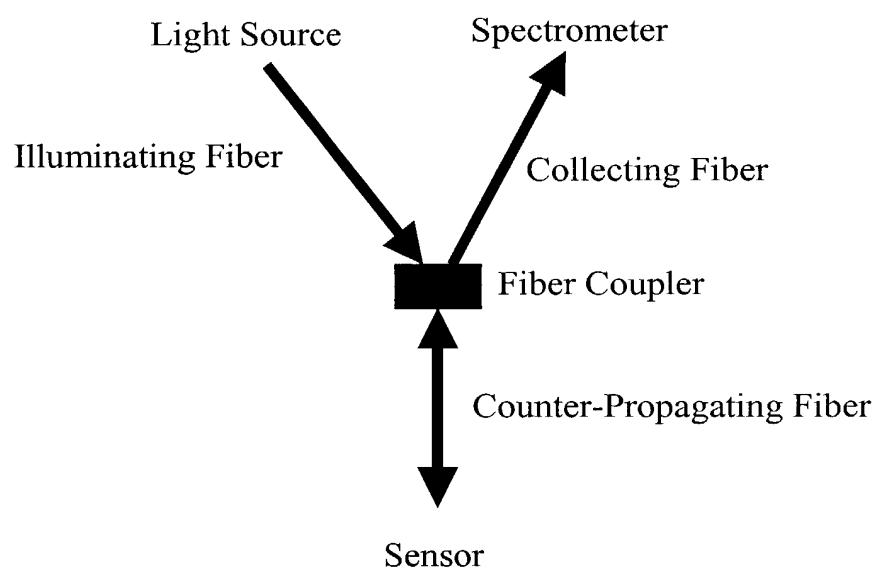


Figure 18

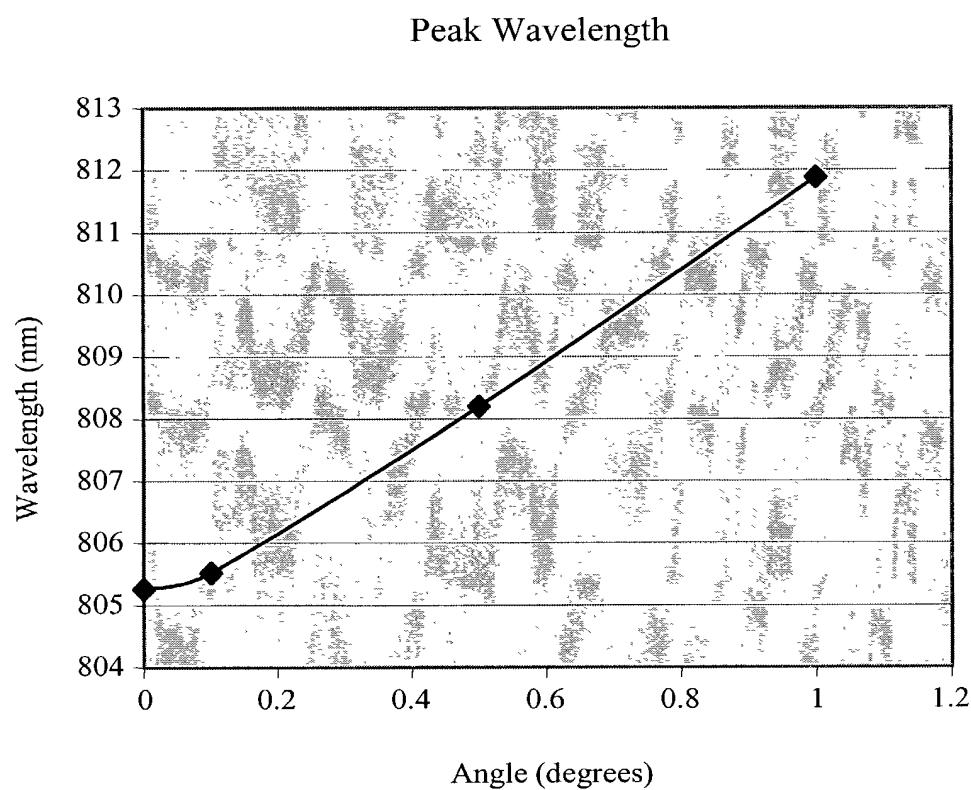


Figure 19

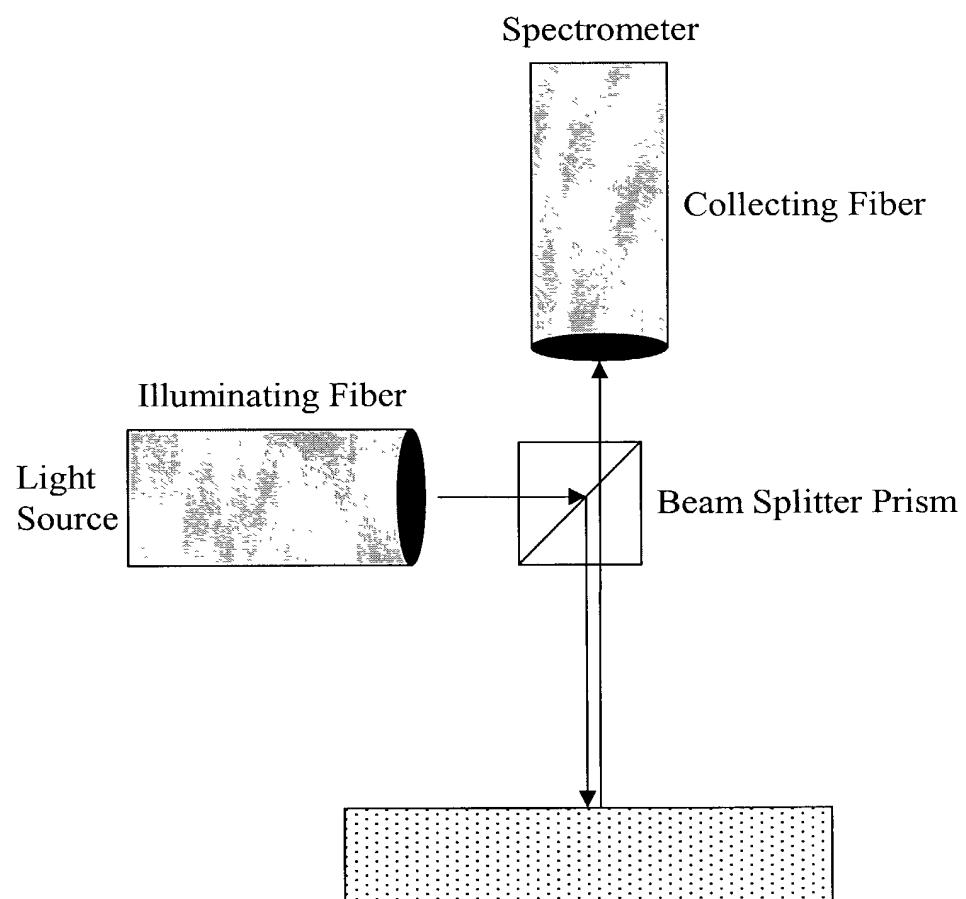


Figure 20



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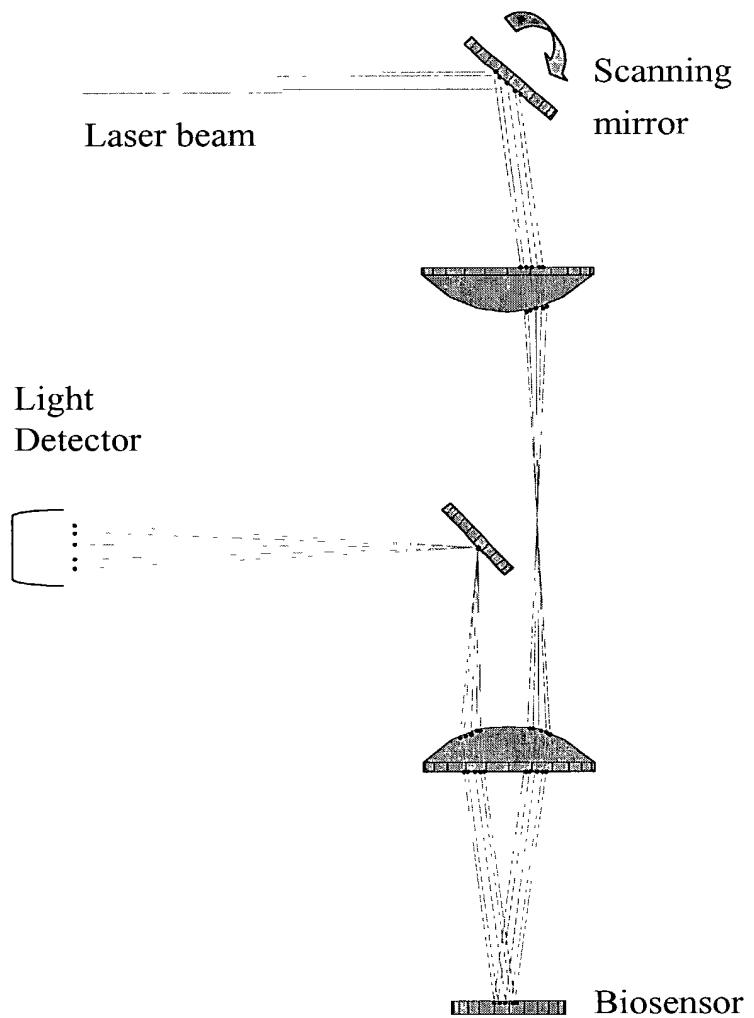


Figure 21



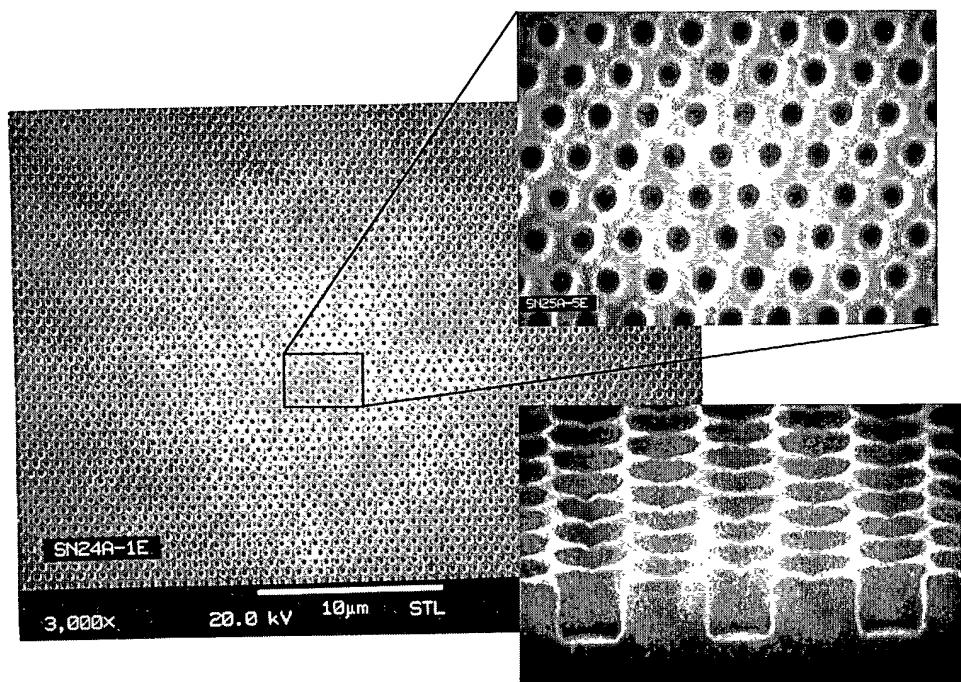


Figure 22

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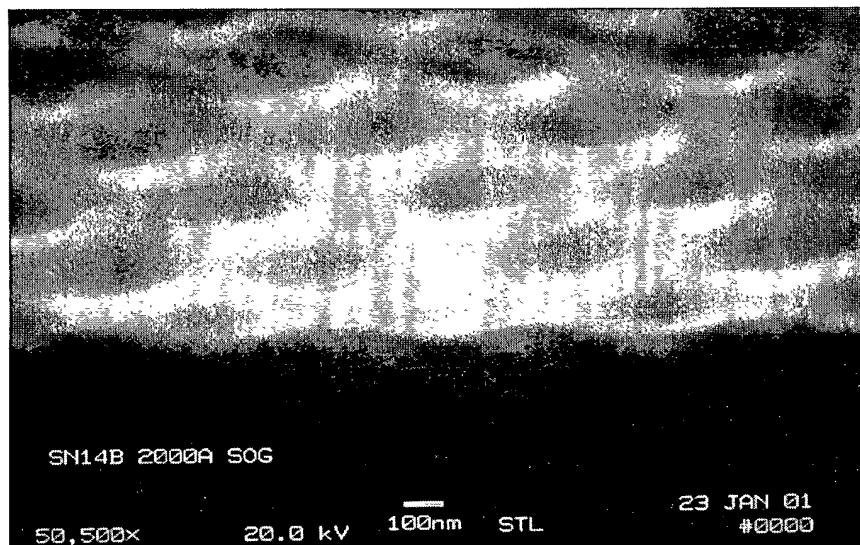


Figure 23

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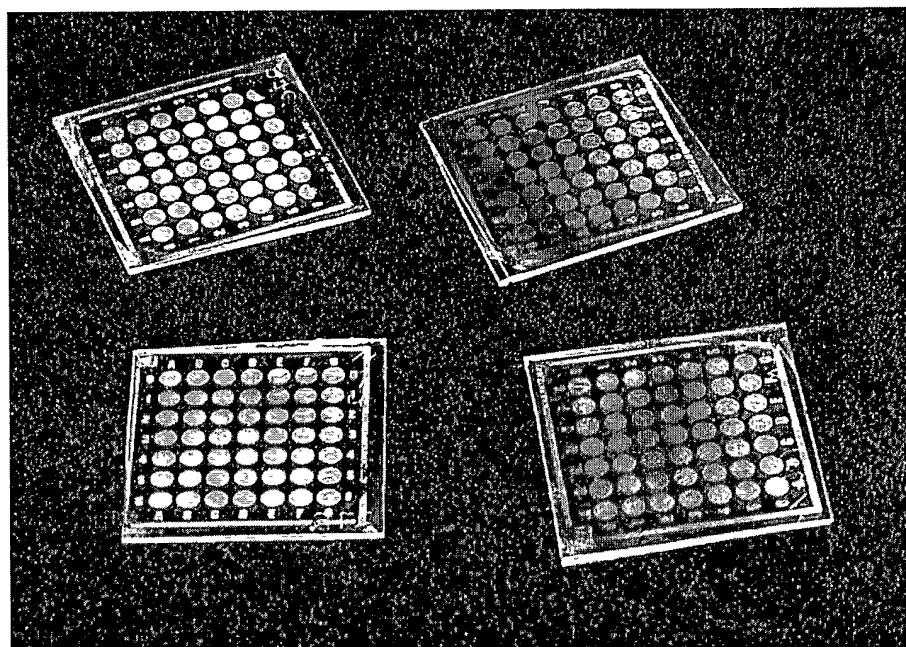
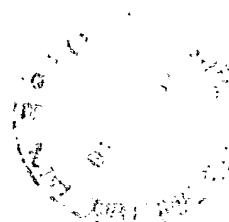


Figure 24



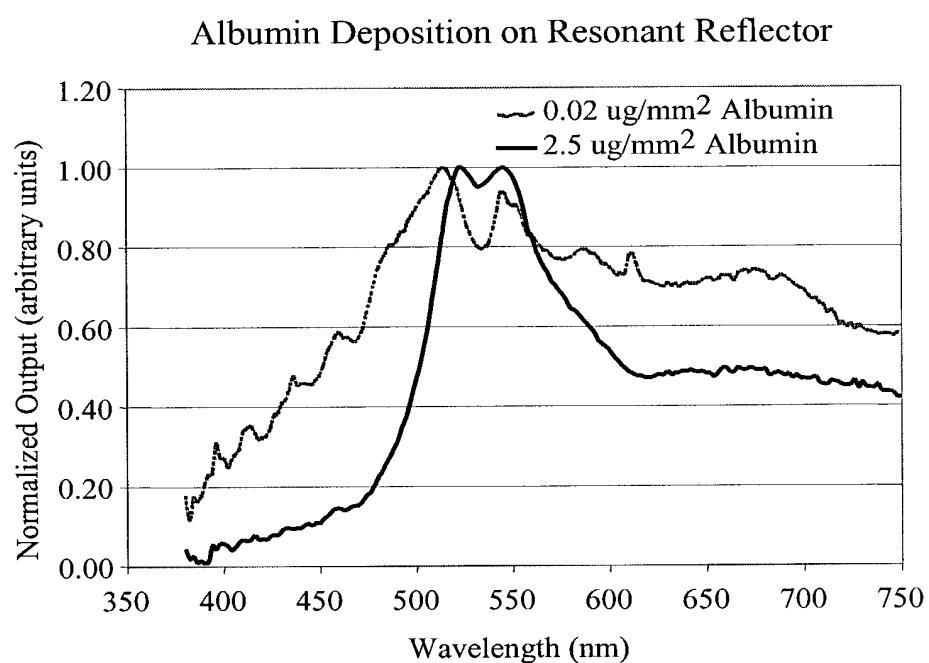


Figure 25

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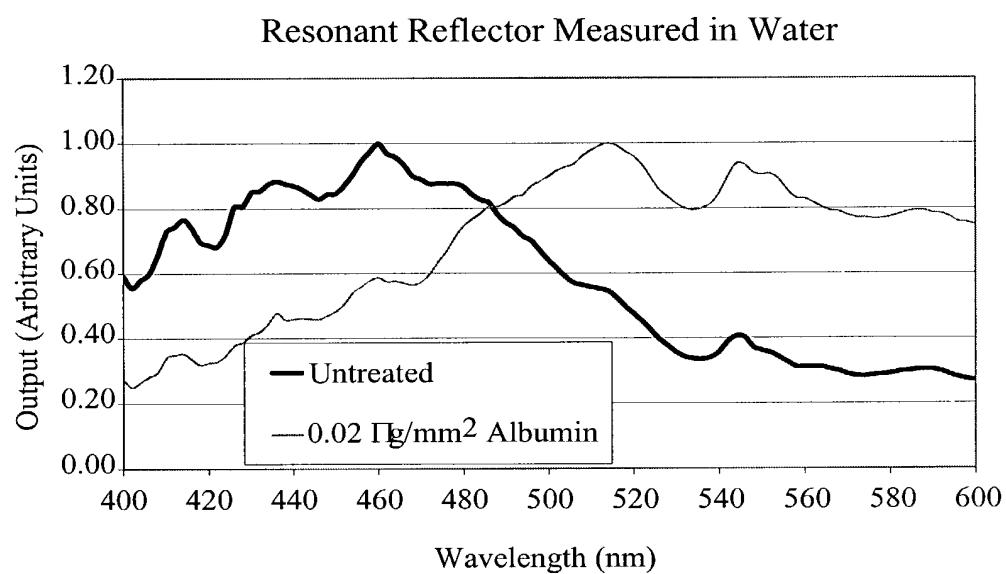


Figure 26

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Bacteria immobilization on structure

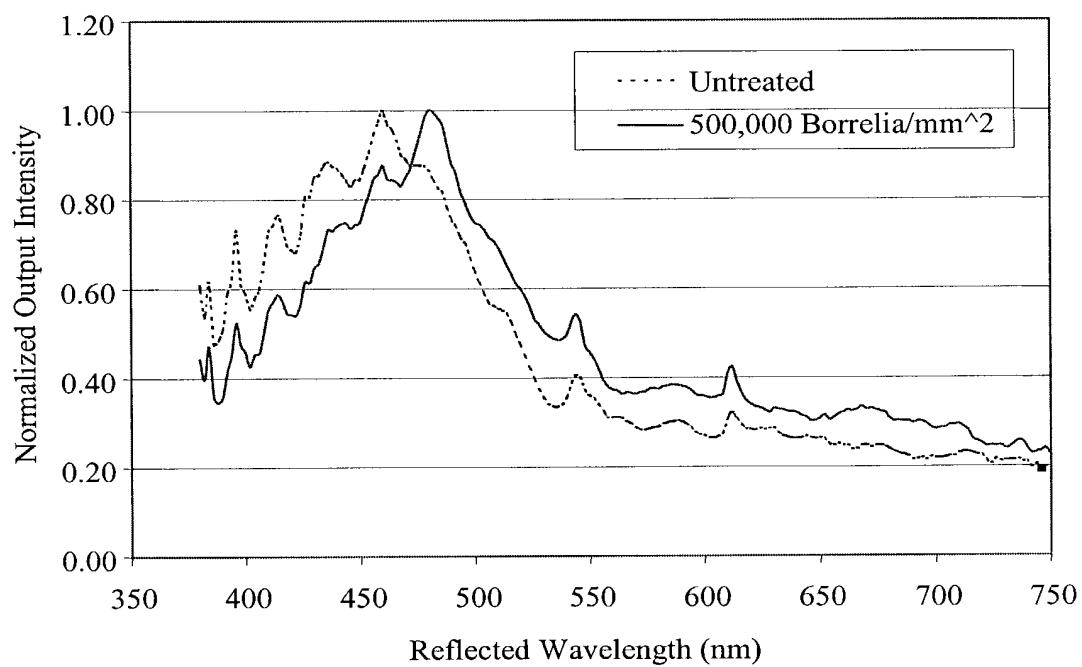


Figure 27

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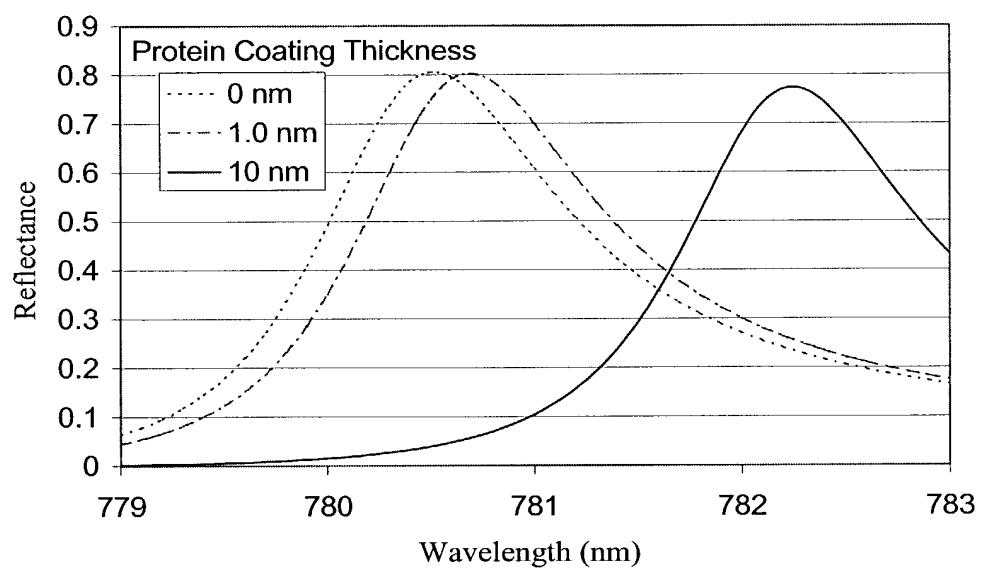


Figure 28

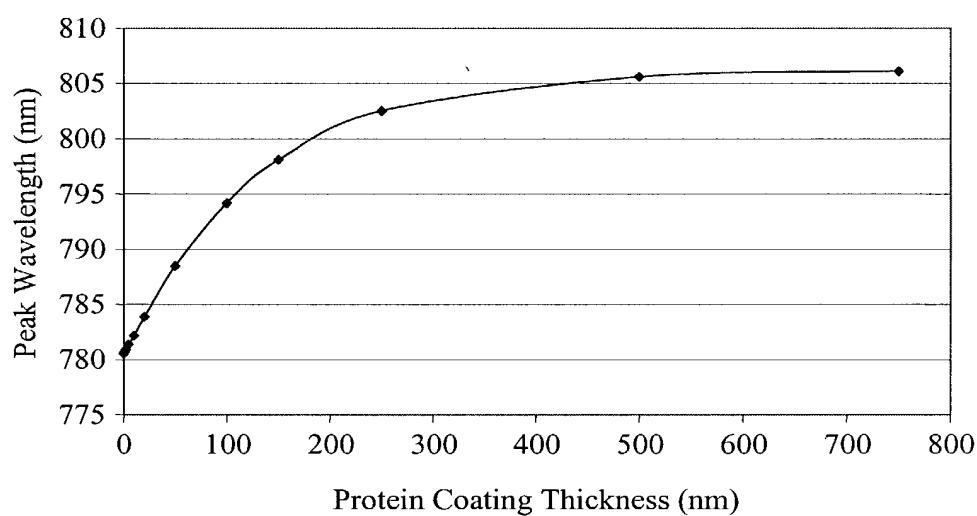


Figure 29

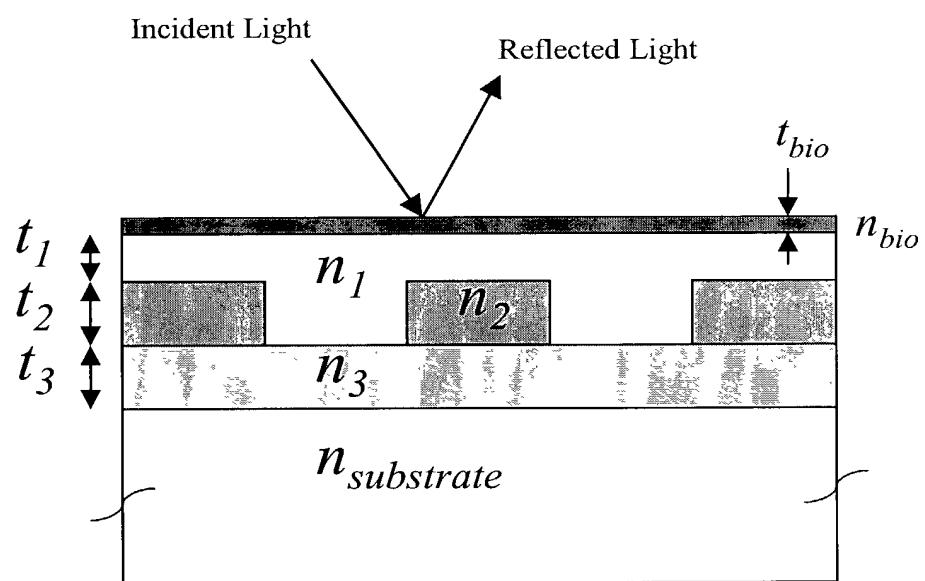


Figure 30

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Reflected Resonance with Deposited Protein

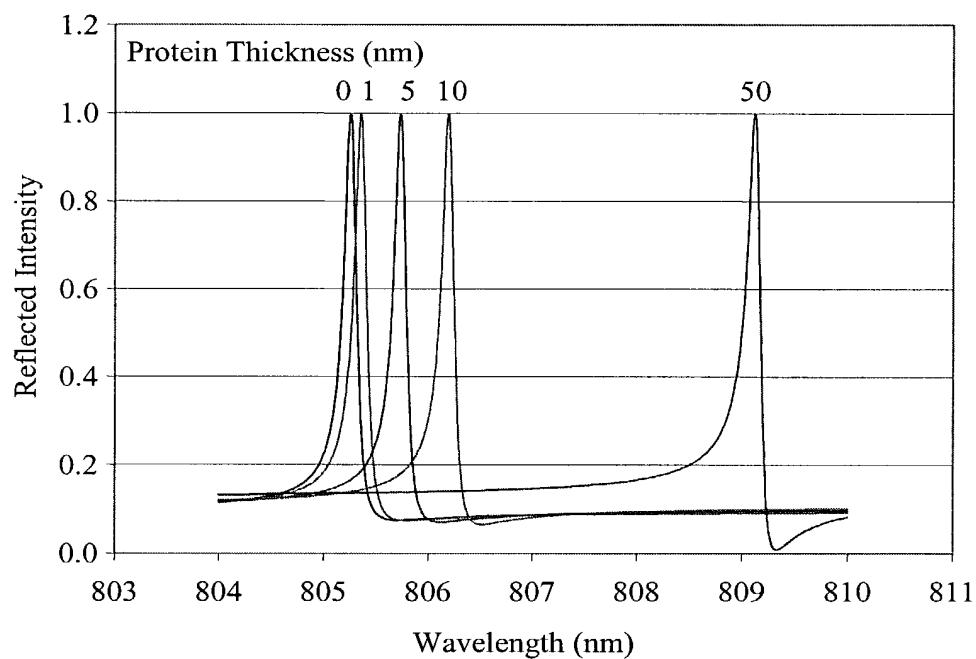


Figure 31

Resonant Peak Wavelength Dependence
on Deposited Protein Thickness

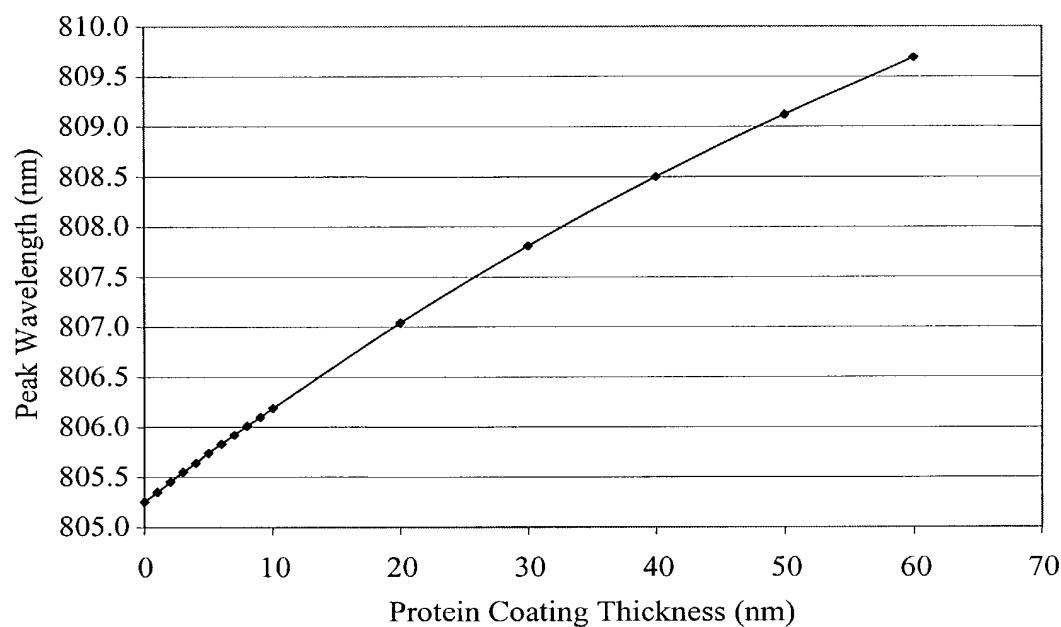


Figure 32

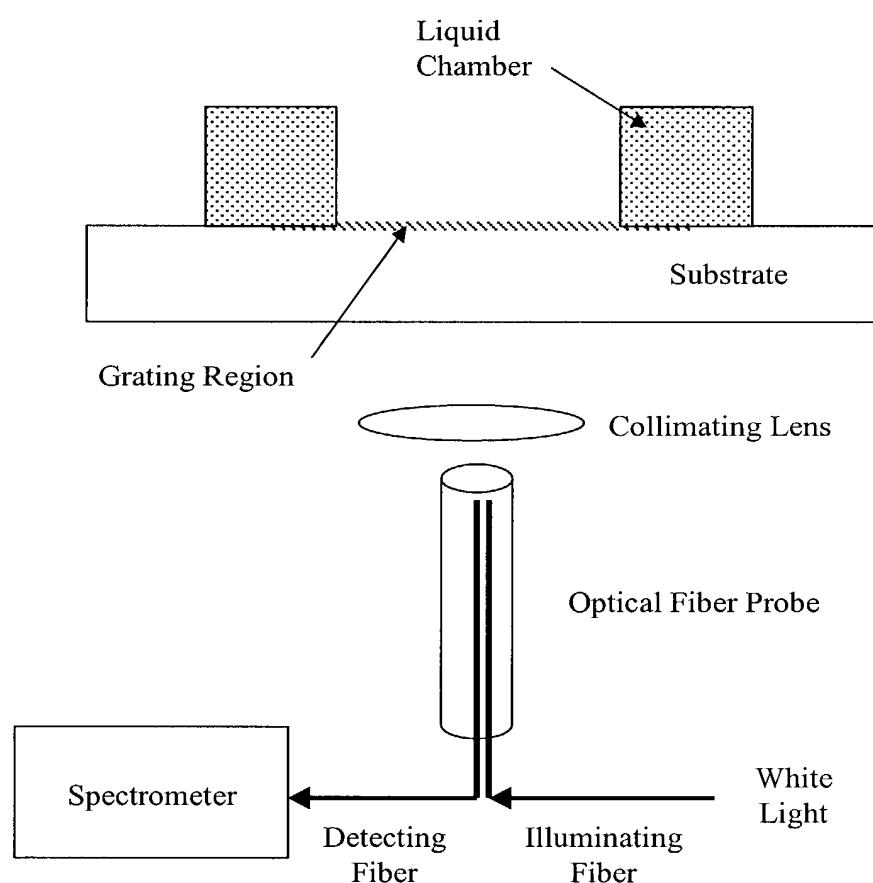


Figure 33



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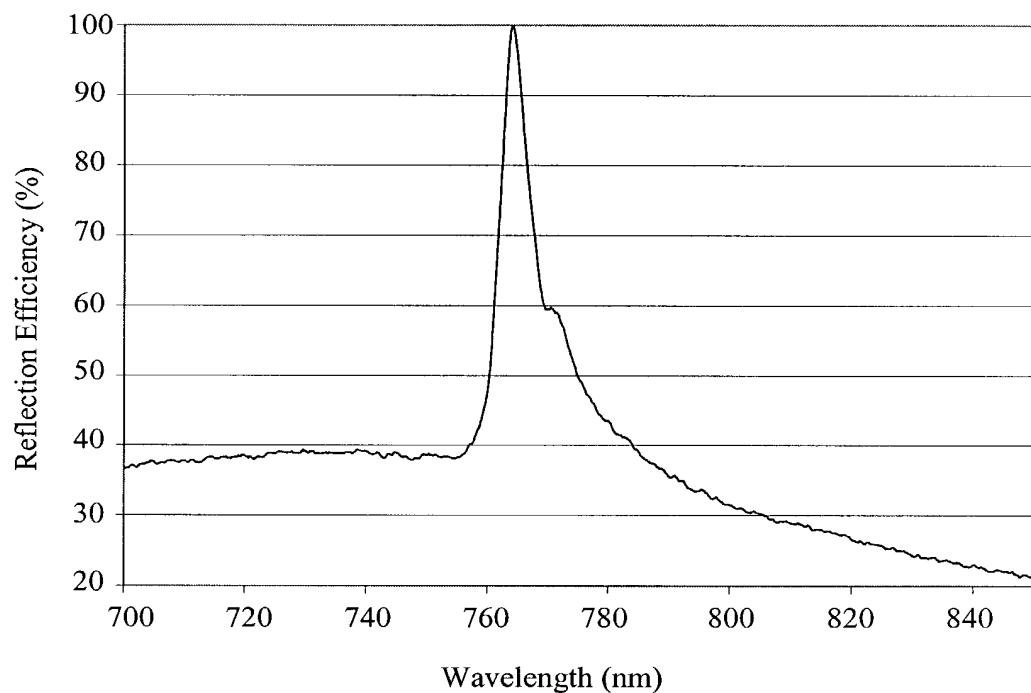


Figure 34

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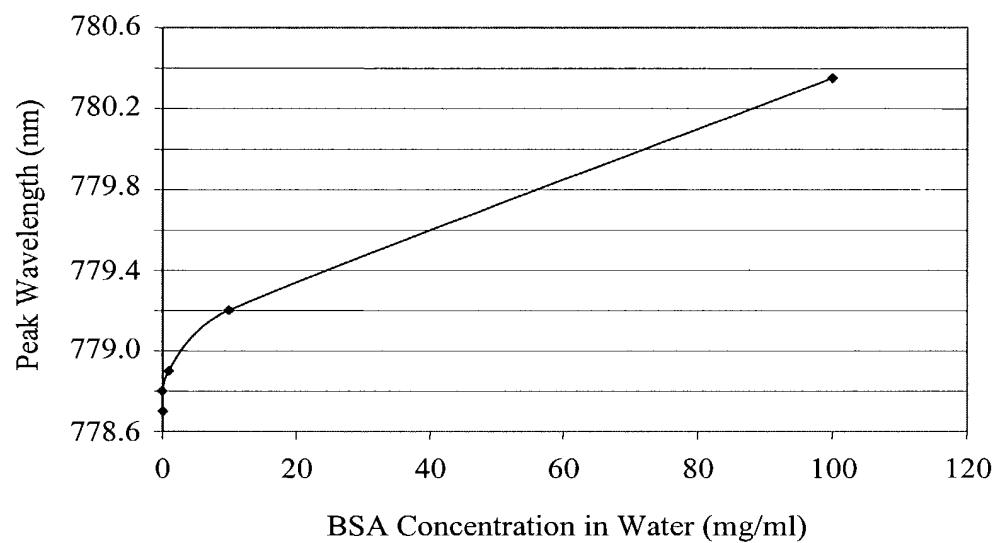


Figure 35

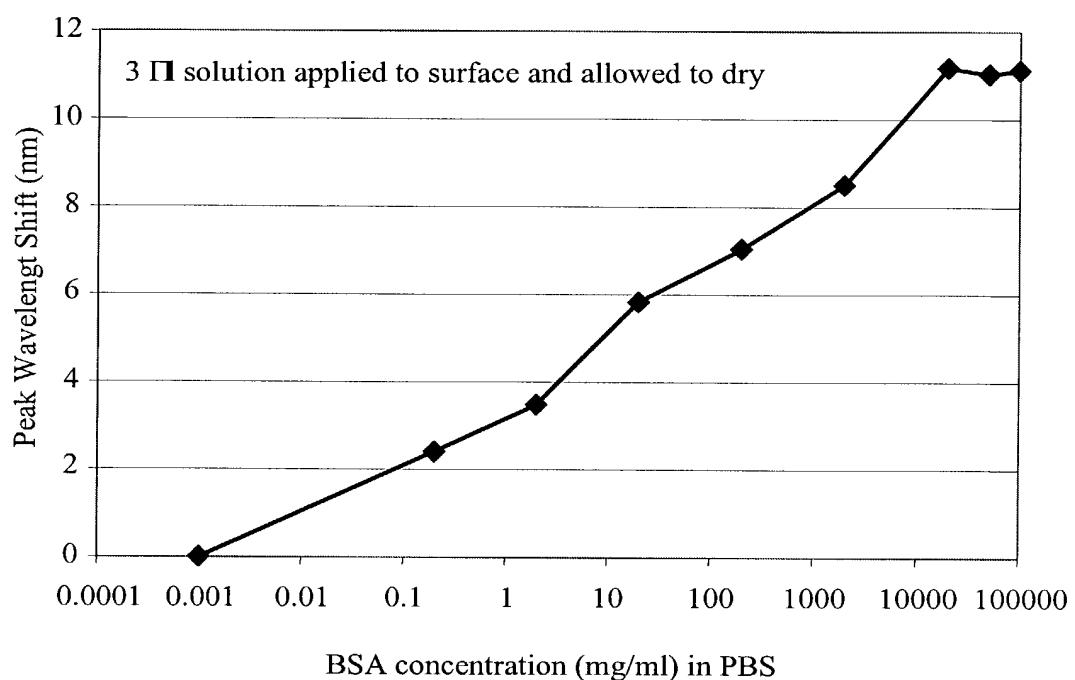


Figure 36

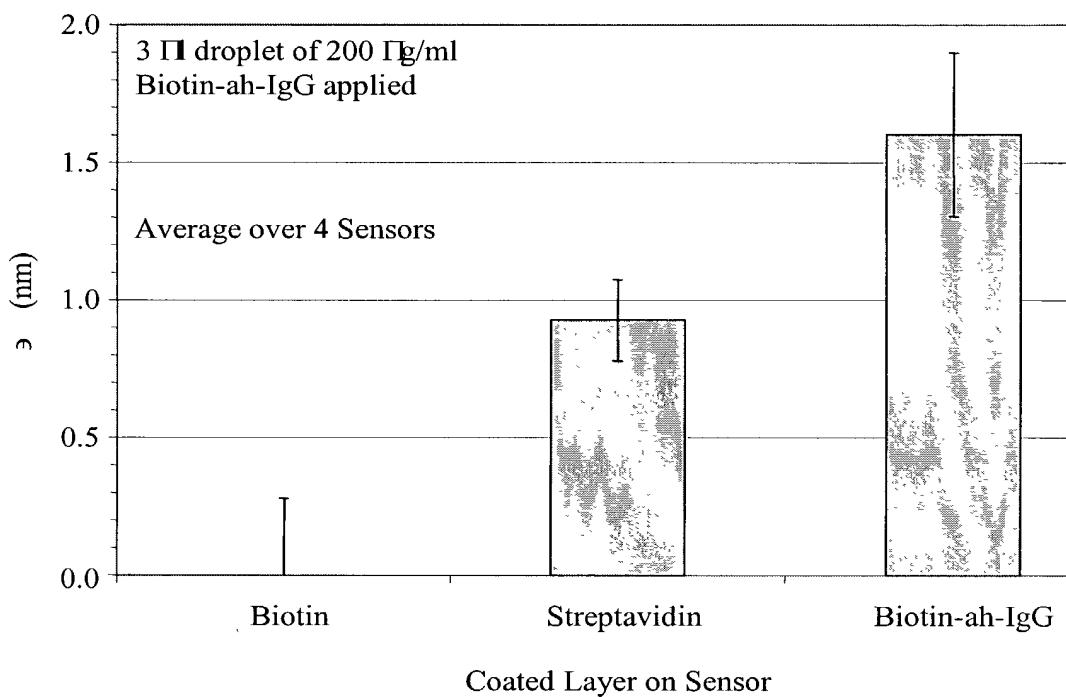


Figure 37A

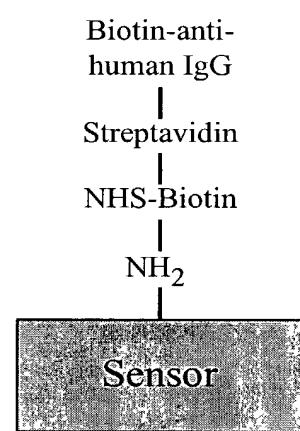


Figure 37B

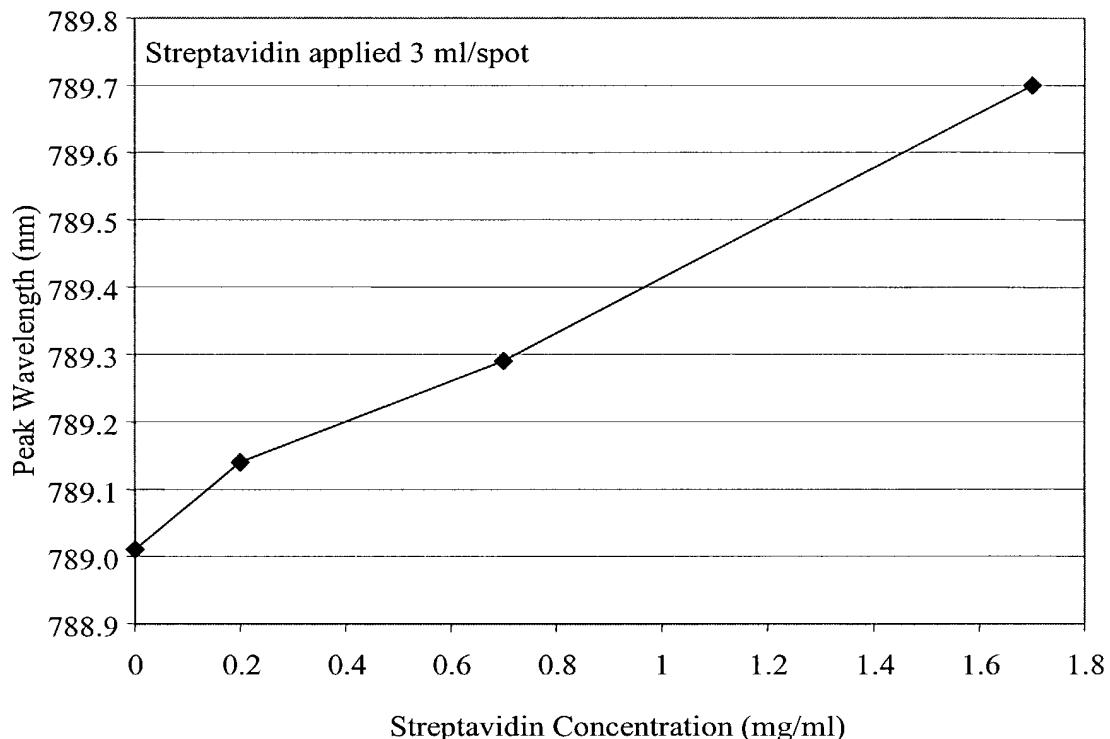


Figure 38A

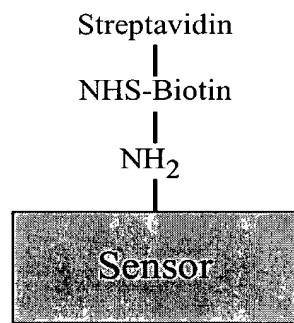


Figure 38B

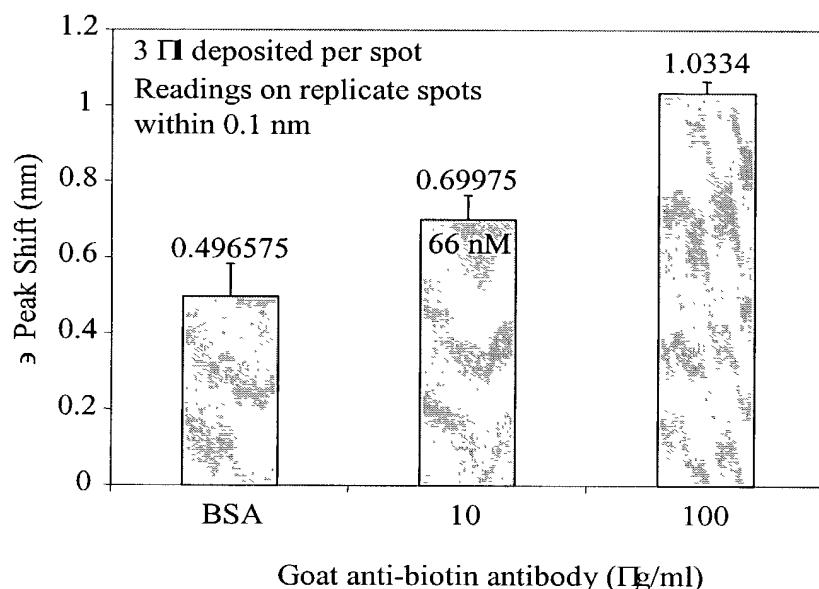


Figure 39A

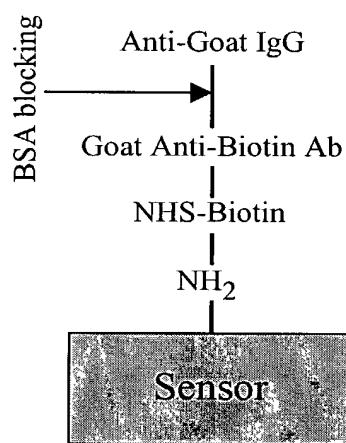


Figure 39B

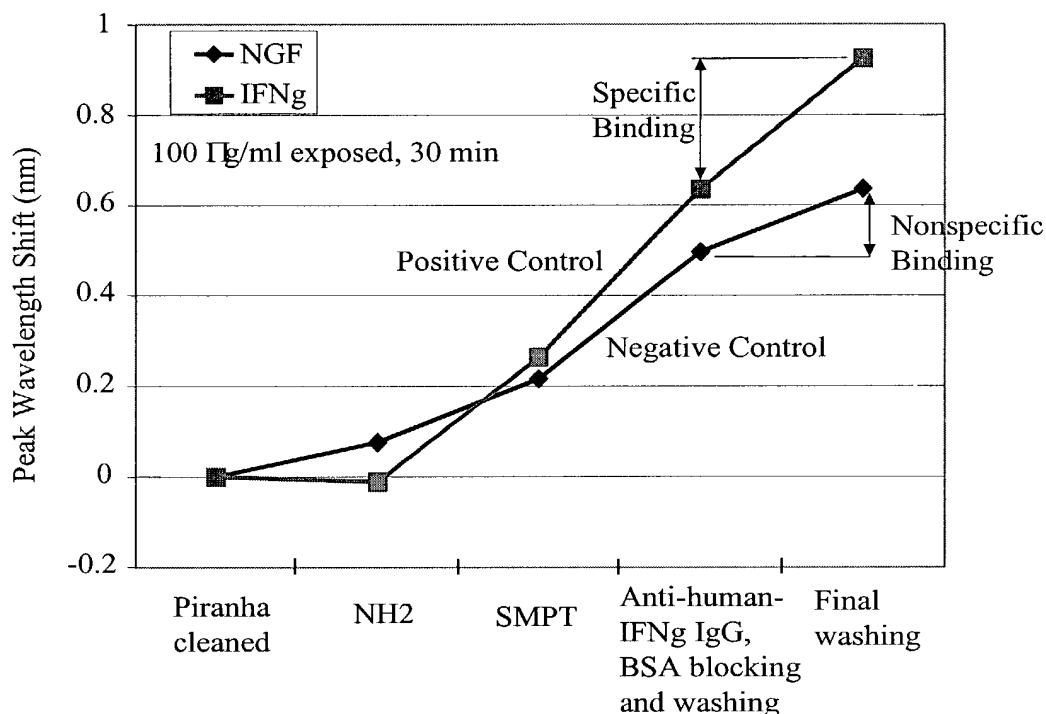


Figure 40A

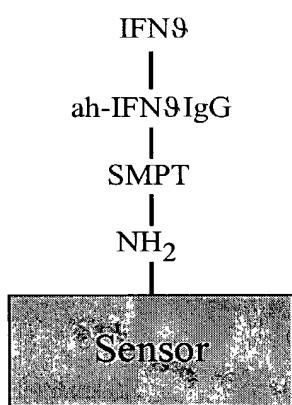


Figure 40B

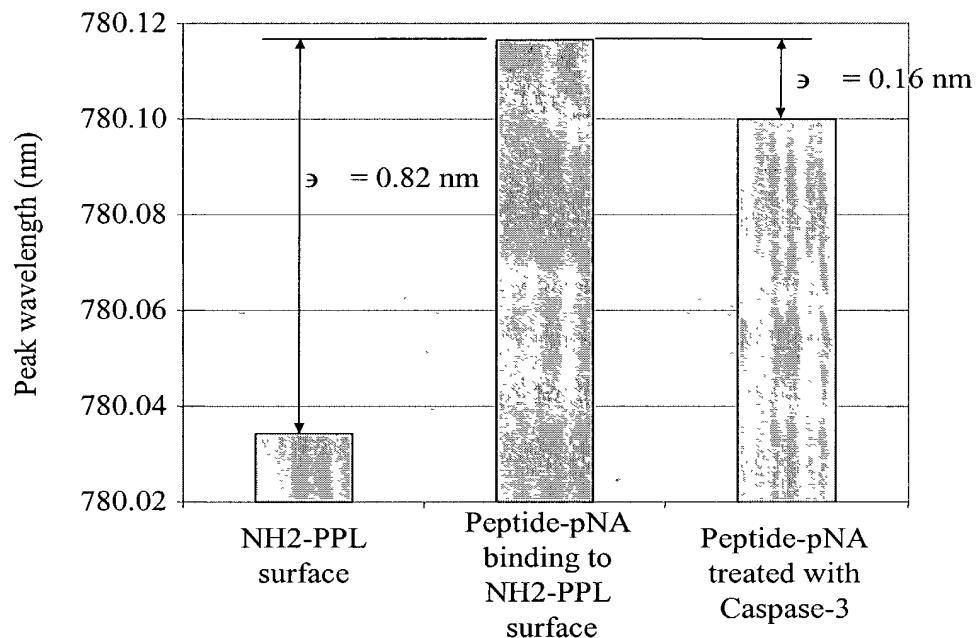


Figure 41A

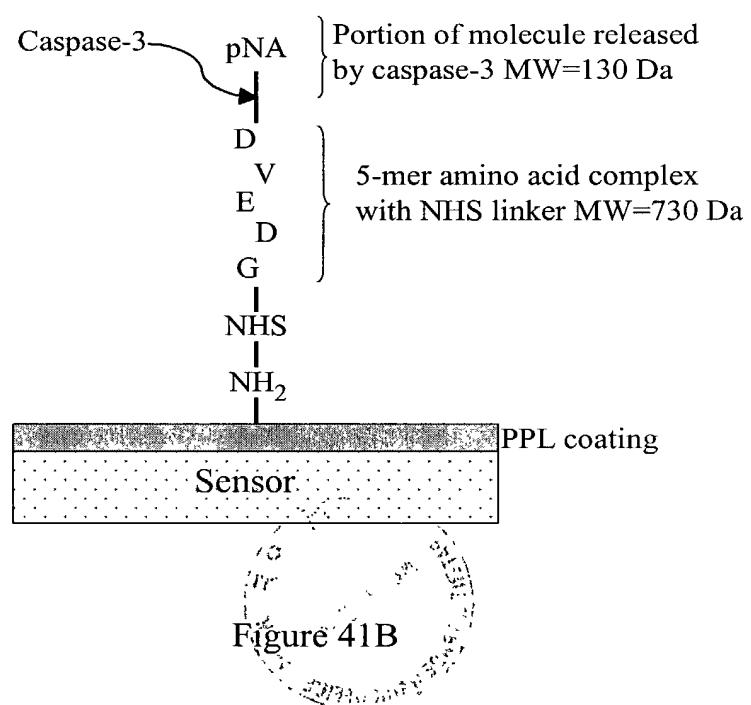


Figure 41B

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Measured shifting of the resonant wavelength caused by the binding of various biomolecular layers.

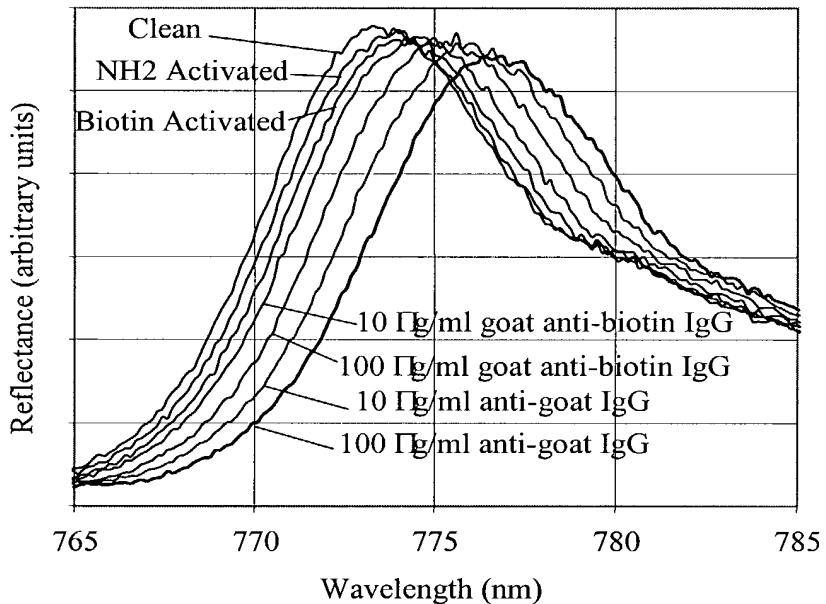


Figure 42A

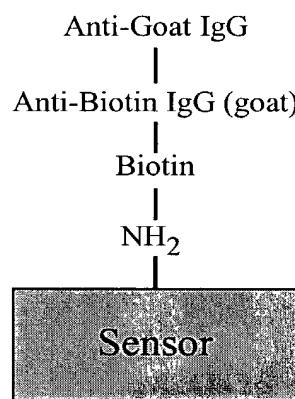


Figure 42B

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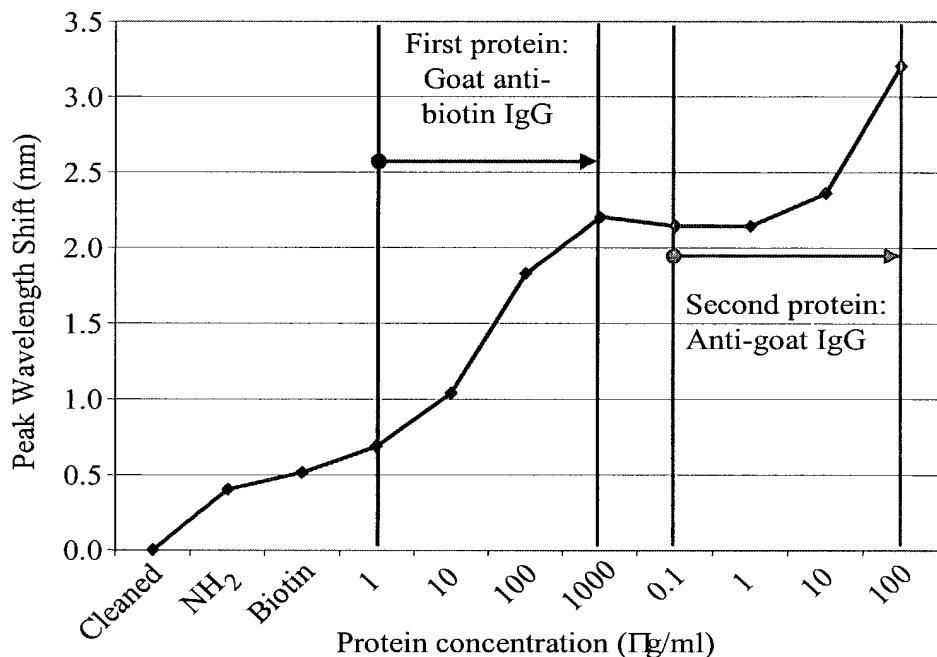


Figure 43A

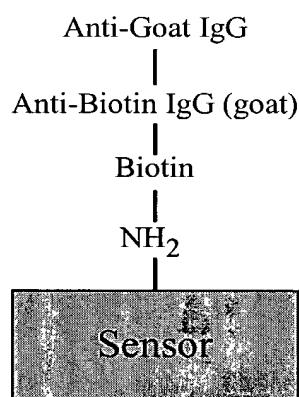


Figure 43B

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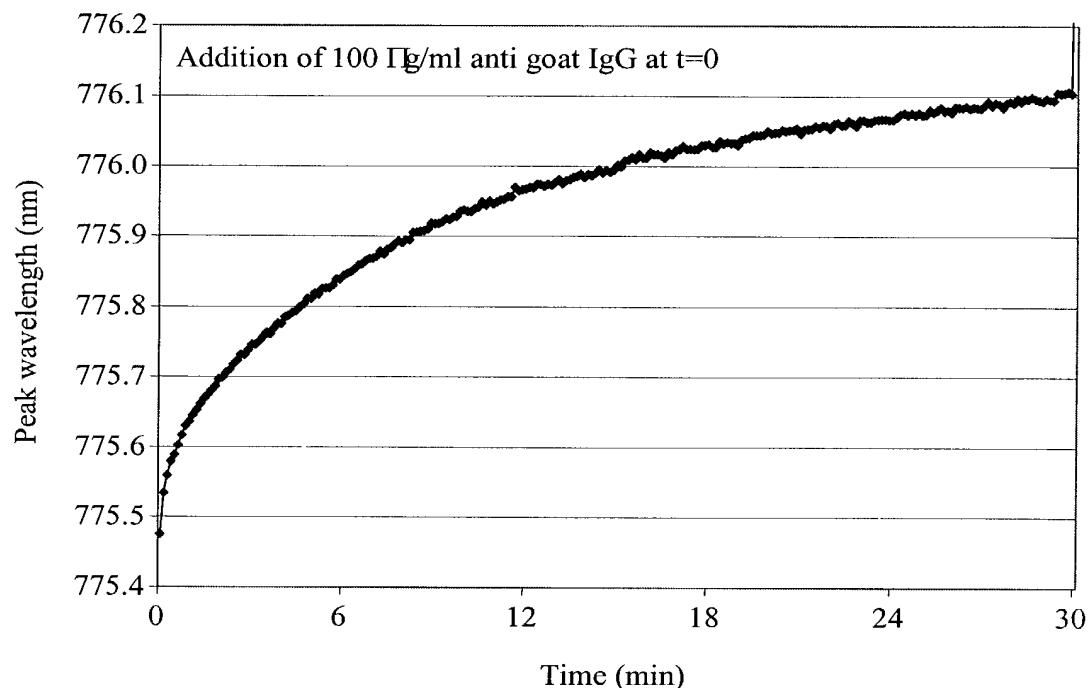


Figure 44A

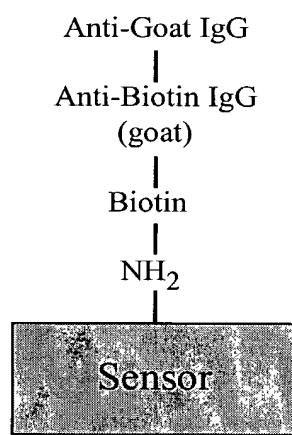


Figure 44B

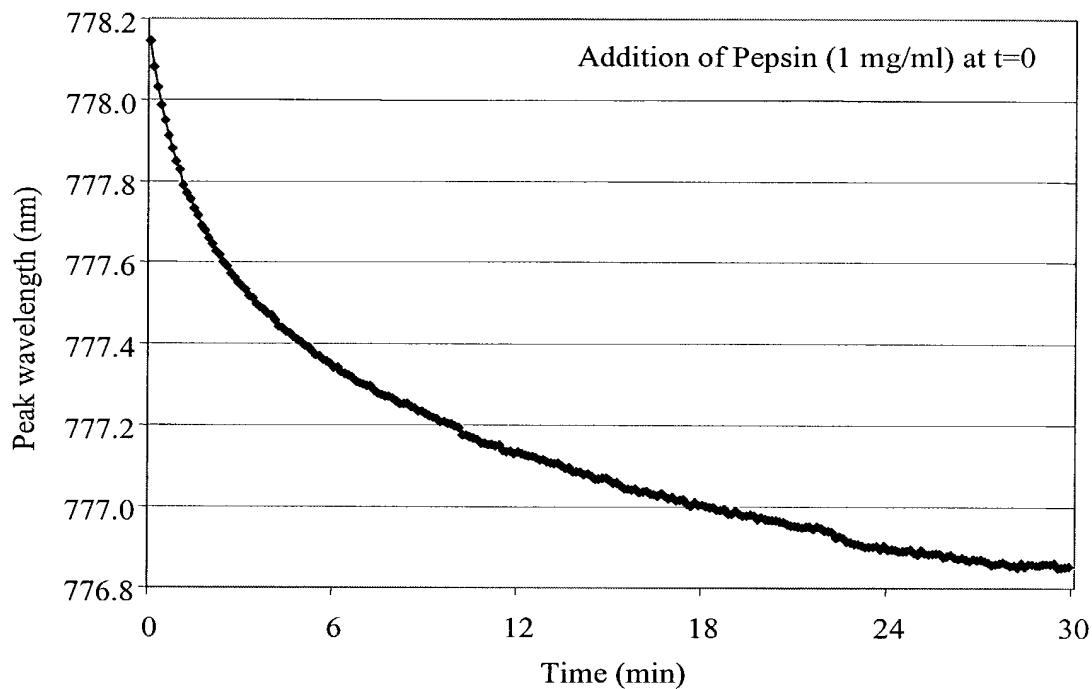
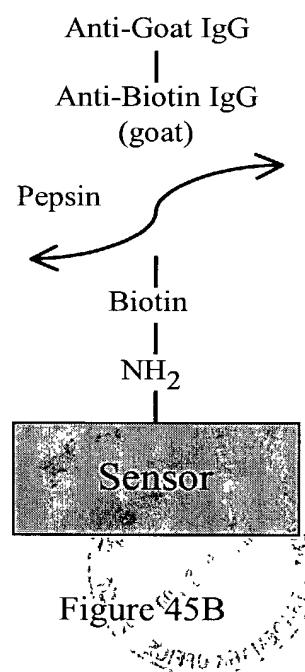


Figure 45A



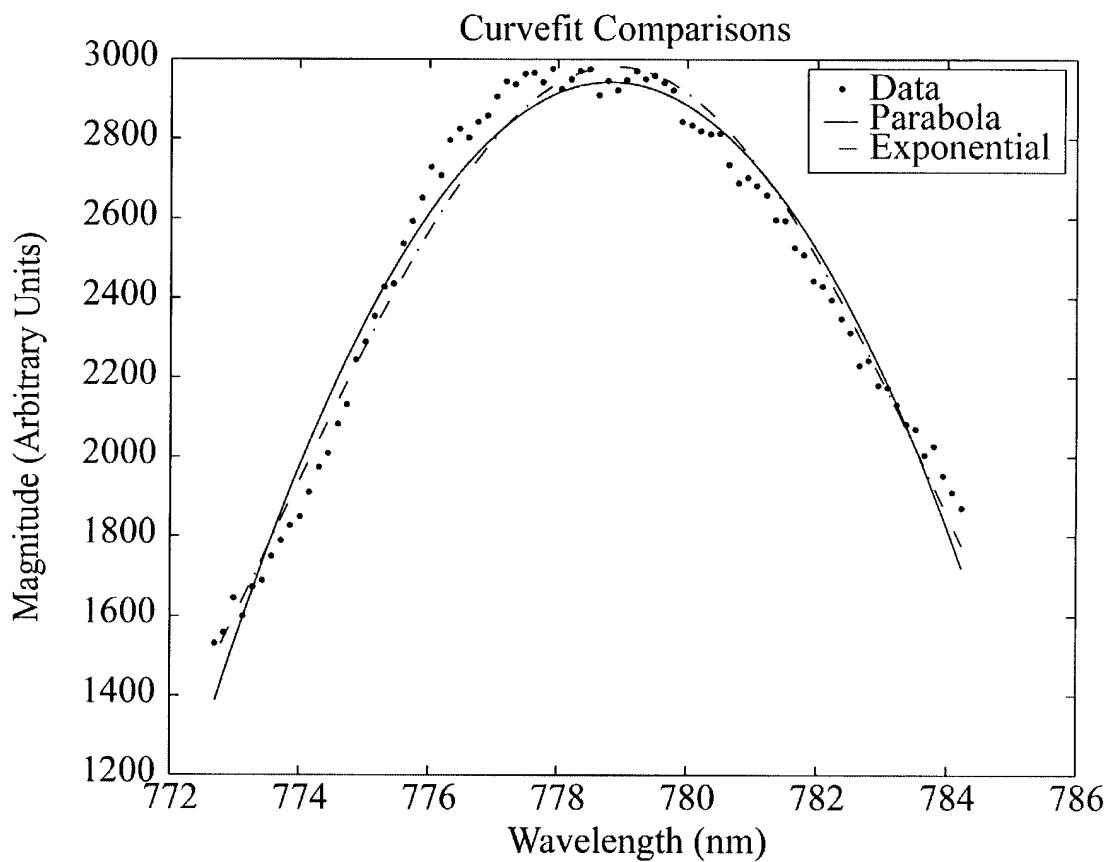


Figure 46

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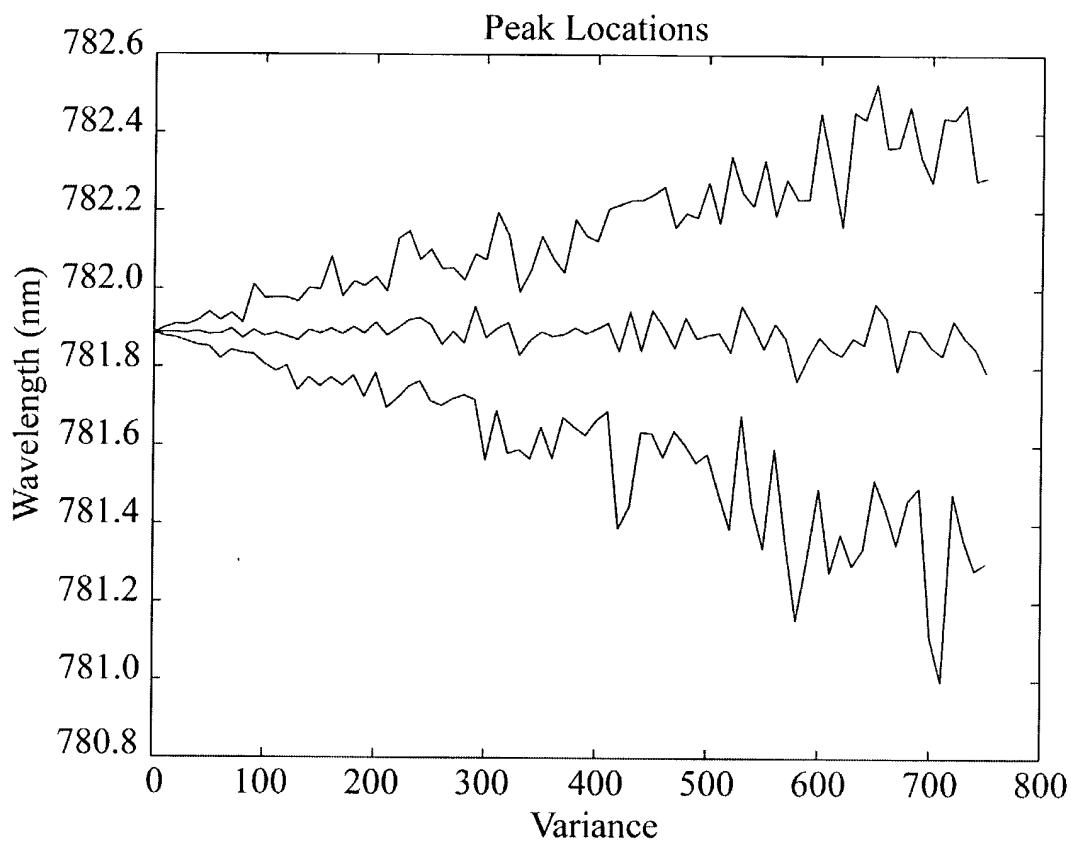
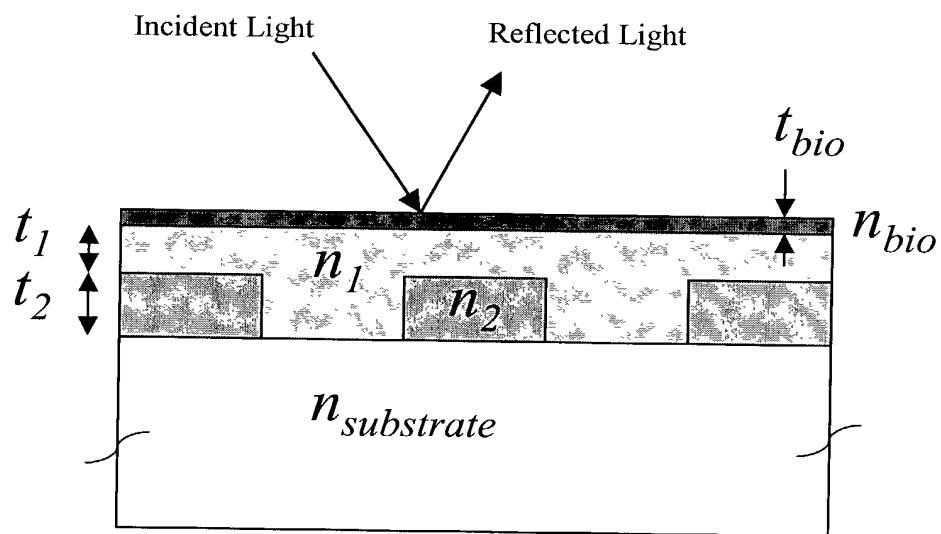


Figure 47





Material 1 = Electrical Insulator (photoresist, epoxy, glass)
Material 2 = Indium tin oxide conductor
Substrate = Glass

Figure 48

Concentric Circle Design

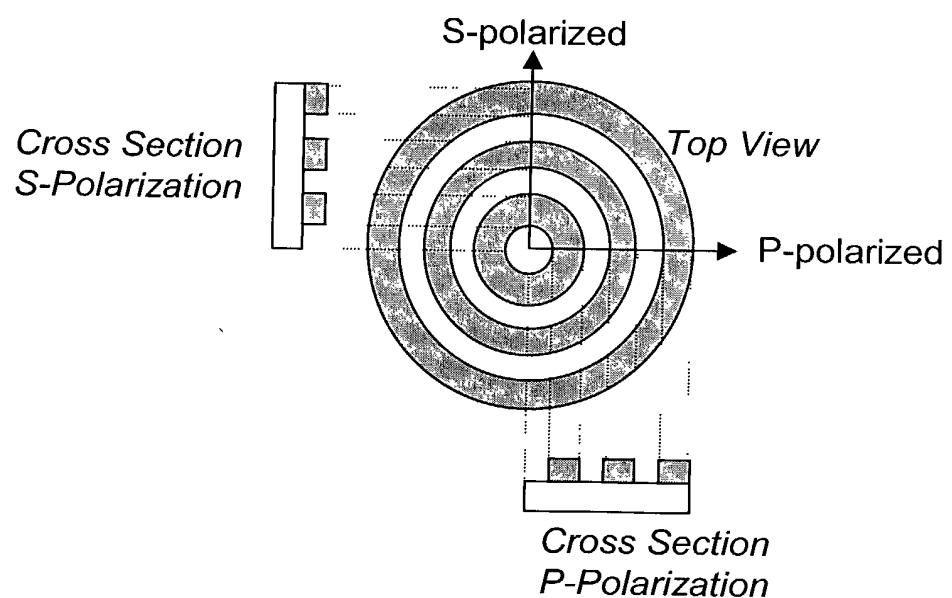


Figure 49

Hexagonal Grid Design

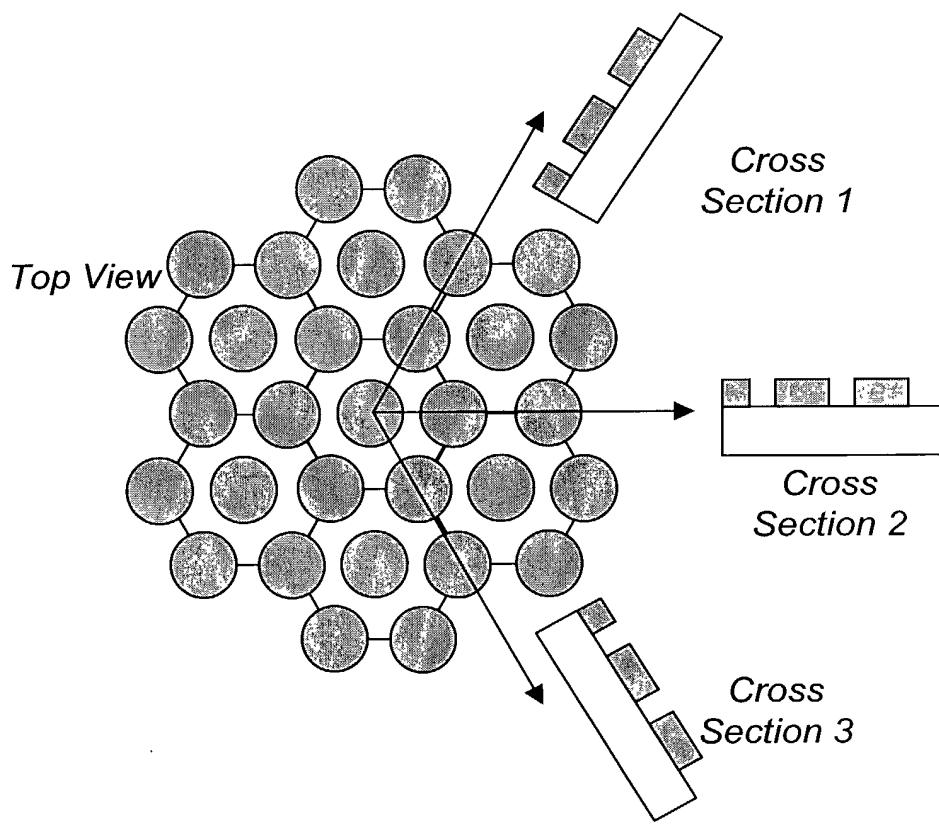


Figure 50



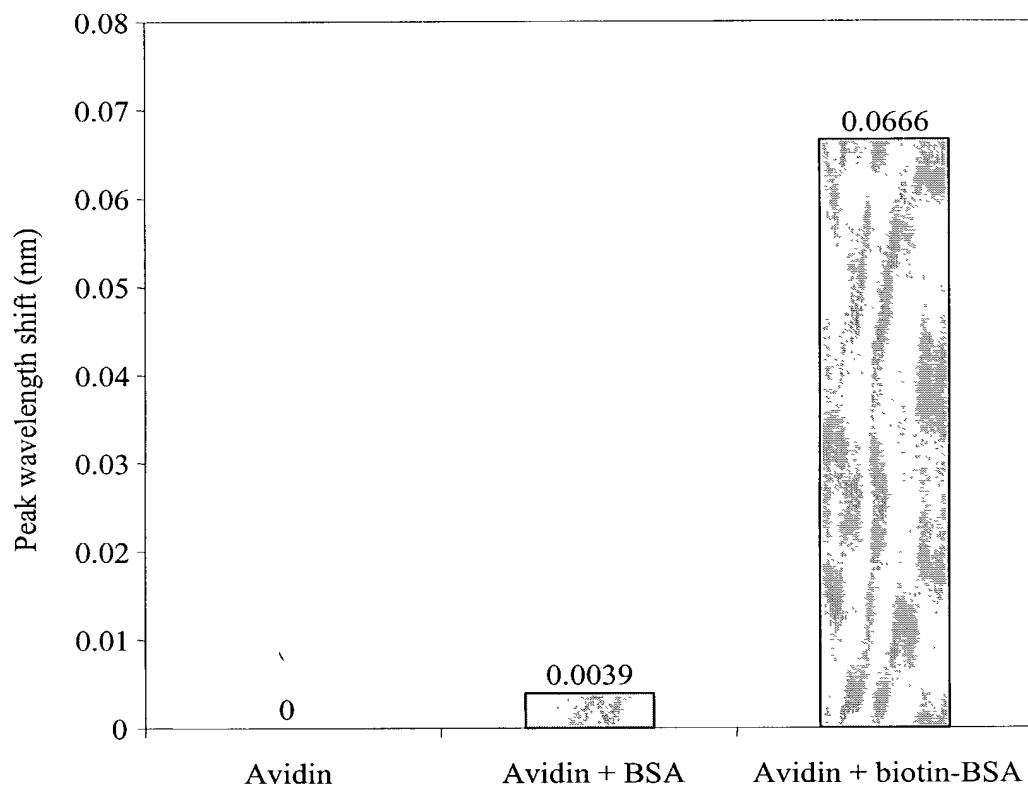


Figure 51

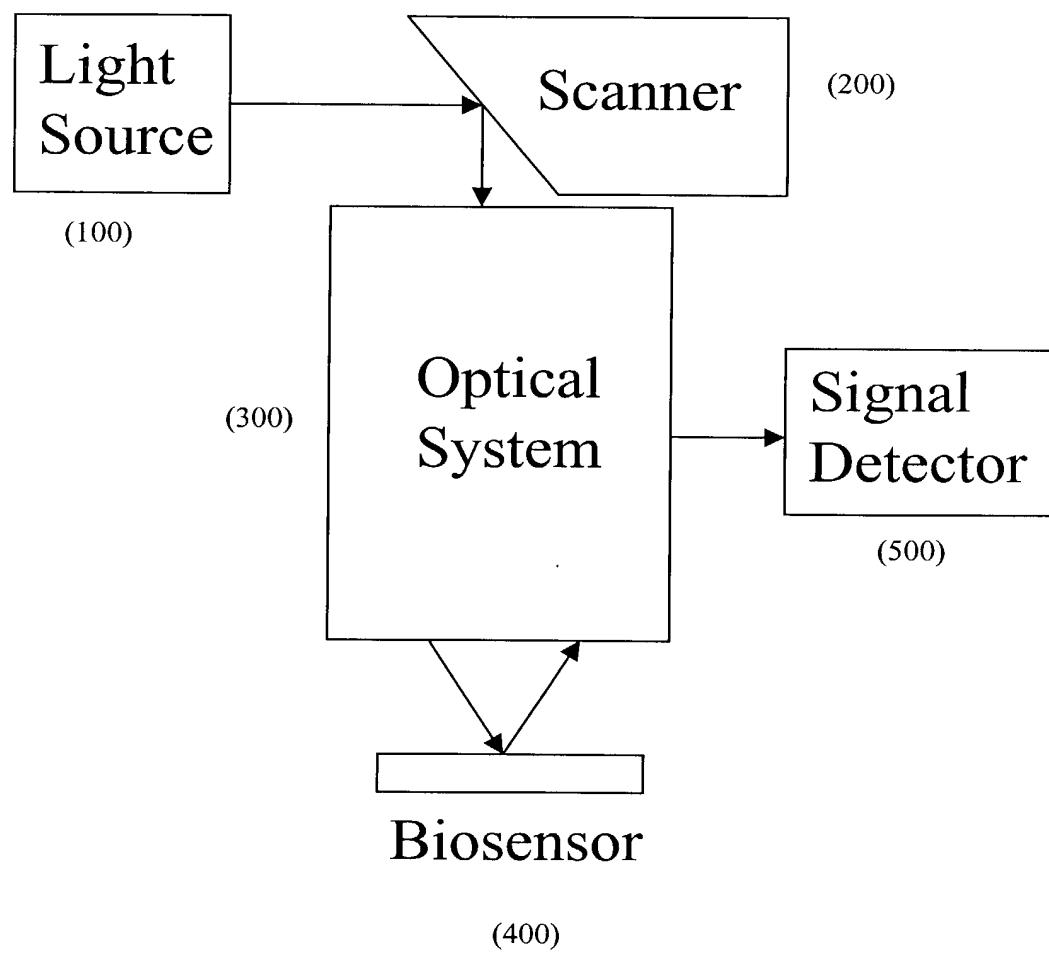


Figure 52